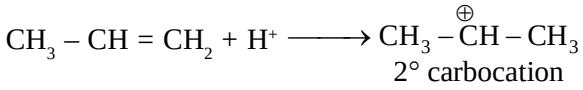
SOLUTION TEST-B

1. In the presence of heat and uv-light, halogen attacks at the benzylic position (position next to the benzene ring) because of the stability of benzyl free radical.

   The correct answer is (ii)

2. The reaction is an example of Markovnikov's addition which involves addition of H^+ to form carbocation as first step.

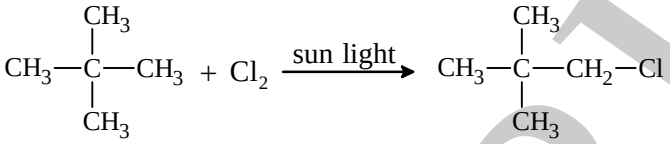


   The correct answer is (i)

3. In S_N2 reaction, nucleophile attacks at the α-carbon from the backside. This results in the inversion of configuration. It means the product has an optical rotation opposite to the starting substrate.

   The correct answer is (iii)

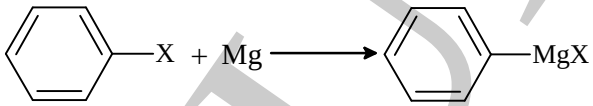
4. The assertion is wrong.



   Neo-pentane on monochlorination gives product which does not have any chiral centre.

   The correct answer is (iv)

5. Haloarenes also form of Grignard reagent with magnesium in dry ether.



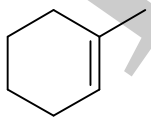
   The correct answer is (iv)

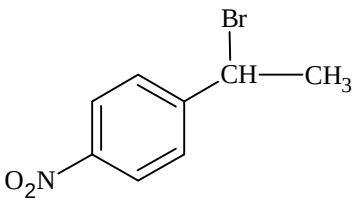
6. $C_6H_5CHClC_6H_5$ is more easily hydrolysable than $C_6H_5CH_2Cl$ because the carbocation $C_6H_5\overset{+}{C}HC_6H_5$ is more stable due to delocalisation of positive charge involving two benzene rings.

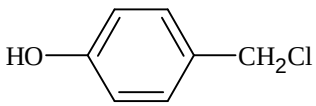
7. 1-bromo-2-methyl-4-(1-methyl propyl) benzene.

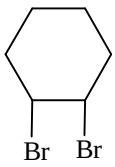
8. (i) Isopropyl chloride < 1-chloropropane < 1-chlorobutane

   (ii) 2-Bromo-2-methyl butane < 2-bromo-3-methyl butane < 1-bromo-3-methyl butane.

9. (i) 

   (ii) 

   (iii) 

   (iv) 

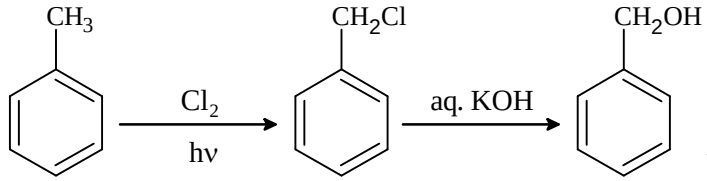
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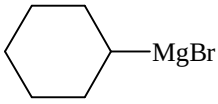
10. (i) Alkyl halides are polar but immiscible in water due to their inability to form hydrogen bonds with water.

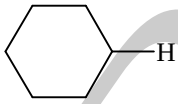
(ii) p-dichloro benzene is more symmetrical and more closely fit into the crystal lattice. Hence, p-dichlorobenezene has a higher melting point and lower solubility than o-dichloro or m-dichlor benzene.

11. (i) $CH_3CH_2OH \xrightarrow{SOCl_2} CH_3CH_2Cl \xrightarrow{\text{eth. KCN}} CH_3CH_2CN$

(ii) 

(iii) $CH_3CH_2OH \xrightarrow{SOCl_2} CH_3CH_2Cl \xrightarrow{Na^+C^- \equiv CCH_3} CH_3CH_2C \equiv CCH_3$

12. (i) A → 

B → 

(ii) R → $CH_3 - \underset{|}{CH} - CH_3$ C → $CH_3 - \underset{|}{\underset{MgBr}{CH}} - CH_3$

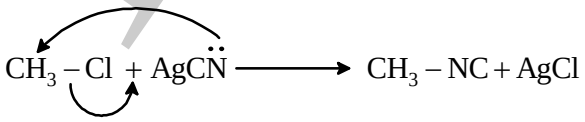
(iii) R′ → $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{C}}}}-$ E → $CH_3-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{\underset{|}{\overset{|}{C}}}}-H$

13. (i) The lone pair of electron of halogen participates into resonance with the benzene ring (+R effect) and increases the electron density more at ortho and para position than at meta position. So, the halogen atom directs the incoming electrophile at ortho and para position. Hence, halogen is ortho-para directing. But due to more electronegativity of halogen than carbon, halogen exerts –I effect and deactivate the benzene.

(ii) In KCN, K – C bond is ionic. The carbon acquires a negative charge and is the nucleophilic centre. The carbon of KCN attacks at the CH_3 group of CH_3Cl to form CH_3CN.



In AgCN, Ag – C bond is covalent and there is no negative charge on carbon. Nitrogen, due to the presence of lone pair of electron is the nucleophilic centre and attacks at the CH_3 group of CH_3Cl to form CH_3NC.



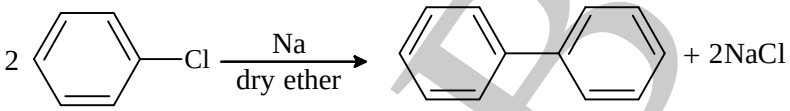
(iii) Conc. H_2SO_4 is a strong oxidising agent. It converts KI into HI and then oxidises HI to I_2. So, there is no I^- and hence no nucleophilic substitution reaction.

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14. (a)

	S_N1 reaction		S_N2 reaction
(i)	It is a two step reaction, step 1. is bond breaking and step 2. is bond formation.	(i)	It is a one step mechanism, both bond breaking and bond formation takes place simultaneously
(ii)	The rate equation is $r = k[RX]$	(ii)	The rate equation is $r = k[RX][Nu^-]$
(iii)	The rate determining step is the formation of carbocation	(iii)	The rate determining step is the formation of transition state
(iv)	The reactivity order is 1° RX < 2°RX < 3°RX	(iv)	The reactivity order is 3°RX < 2°RX < 1°RX

(b) **Fittig reaction** is a reaction of halobenzene with sodium in the presence of dry ether to form diphenyl.



chlorobenzene diphenyl

15. (a) $A \rightarrow CH_3-\underset{\underset{Cl}{|}}{CH}-CH_3$ $B \rightarrow CH_3-\underset{\underset{CH_3}{|}}{CH}-\underset{\underset{CH_3}{|}}{CH}-CH_2$

$C \rightarrow CH_3-\underset{\underset{CH_3}{|}}{CH}-\underset{\underset{CH_3}{|}}{CH}-CH_2-Cl$ $D \rightarrow CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{Cl}{|}}{C}}-\underset{\underset{CH_3}{|}}{CH}-CH_3$

Reactions are:

$$CH_3-CH=CH_2 \xrightarrow[\text{Benzoyl peroxide}]{HCl} \underset{\underset{Cl}{|}}{CH_3-CH-CH_3}\ (A) \xrightarrow[\text{dry ether}]{Na} \underset{\underset{CH_3}{|}}{CH_3-CH-\underset{\underset{CH_3}{|}}{CH}-CH_3}\ (B)$$

$$\underset{\underset{CH_3}{|}}{CH_3-CH-\underset{\underset{CH_3}{|}}{CH}-CH_2-Cl}\ (C) \qquad \underset{\underset{CH_3}{|}}{\overset{\overset{Cl}{|}}{CH_3-CH-C}}-CH_3\ (D)$$

(b)

$$\underset{\underset{Cl}{|}}{CH_3-CH-CH_3} \xrightarrow[\text{eth. KOH}]{\text{hot and}} CH_3-CH=CH_2 \xrightarrow[\text{peroxide}]{HBr/\text{Benzoyl}} CH_3-CH_2-CH_2-Br$$

$$\xrightarrow{AgNO_2} CH_3-CH_2-CH_2NO_2$$

(c) $CH_3 - I$ is more reactive than $CH_3 - Br$ because I^- is a better leaving group than Br^-.

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